

fuel ratio in the surrounding atmosphere thereof is lean and releasing the absorbed NO_x when said air-fuel ratio is stoichiometric or rich; a catalytic apparatus for purifying NO_x arranged in the exhaust system upstream of said particulate filter, which catalytic apparatus carries a catalyst absorbing NO_x when the air-fuel ratio in the surrounding atmosphere thereof is lean and releasing the absorbed NO_x when said air-fuel ratio is stoichiometric or rich; and bypassing means to make possible the exhaust gas bypass said particulate filter downstream said catalytic apparatus. Such a device is nowhere taught or suggested by the cited references.

Dou does not teach or suggest a particulate filter or a catalytic apparatus for purifying NO_x. Rather, Dou discloses a method for providing a sulfur scavenger and a downstream NO_x absorber catalyst within an exhaust stream. The sulfur scavenger preferably uses trapping metals such as silver, aluminum, barium, cerium, cobalt, copper, lanthanum, lithium, magnesium, sodium, neodymium, rubidium, tin, strontium and zinc. See paragraph [0036] of Dou. In contrast, the claimed invention requires a catalytic apparatus that employs a process of purifying nitrous oxides NO_x. As is well known in the art, such sulfur scavenger of Dou and NO_x purifiers of the claimed invention are distinctly different. The catalytic apparatus of the claimed invention uses an alkali metal (*e.g.*, potassium) or alkali earth metal having stronger ionization than calcium Ca (within the exhaust). In the claimed invention, the potassium (or other component) bonds with sulfur trioxide SO₃ to form potassium sulfate K₂SO₄. This product passes the partition walls of the particulate filter rather than forming an ash of calcium sulfate CaSO₄ that could block the particulate filter. See specification at page 41, lines 6-23.

Thus, Dou teaches away from the present invention. Dou teaches an apparatus that traps sulfur, rather than an apparatus that purifies NO_x and in the process allows sulfur to pass through the particulate filter.

Further, Dou does not mention a particulate filter, despite identification as such in the Office Action of undescribed item 6 in Fig. 15 of Dou. Hence, there is no motivation to combine a non-included particulate filter with a catalyst for absorbing and reducing NO_x. Additionally, there is no motivation or suggestion in Dou to modify (in fact destroy) its disclosed sulfur scavenger to reach the features of the claimed invention.

Hirota does not overcome the deficiencies of Dou. Hirota is cited for the asserted disclosure that it is conventional in the art to use a catalyzed particulate filter that carries an NO_x absorber. However, regardless of such a disclosure, any combination of Dou and Hirota would not have resulted in the claimed invention.

First, as described above, Dou discloses a sulfur scavenger. Any combination of Dou and Hirota would still include this sulfur scavenger, as neither reference teaches or suggests any reason to remove the inventive sulfur scavenger of Dou in favor of an NO_x purifier as claimed.

Second, as also described above, Dou discloses a downstream NO_x absorber catalyst within an exhaust stream. Any combination of Dou and Hirota would likewise still include this downstream NO_x absorber catalyst, as neither reference teaches or suggests any reason to move the NO_x absorber catalyst from a downstream position to an upstream position, as claimed.

Accordingly, one of ordinary skill in the art would not have been motivated, based on the cited references, to practice the claimed invention. The claimed invention of claims 2-4 thus would not have been obvious over the cited references. Reconsideration and withdrawal of the rejection is respectfully requested.

B. Applicants' Arguments Were Considered and Agreed to by the Examiner

Furthermore, Applicants submit that the above arguments have already been presented to the Examiner, and found persuasive. Similar arguments were previously made in response to a rejection over Dou and Maaseidvaag. See, for example, the Amendments

filed April 30 and September 4, 2002. The arguments were also presented in detail in an Examiner Interview, in which the Examiner agreed that "Applicant's argument that the prior art of record fail to show an upstream catalytic converter that carries the same catalyst as the downstream filter for absorbing and reducing NOx is persuasive." See Interview Summary dated August 5, 2002.

For essentially the same reasons that Dou and Maaseidvaag were found not to disclose or suggest the invention of then independent claim 1 and its dependent claims, instant claims 2-4 would not have been rendered obvious by a combination of Dou and Hirota.

For at least the reasons set forth above, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Joel S. Armstrong
Registration No. 36,430

JAO:JSA

Attachment:
Petition for Extension of Time

Date: May 11, 2005

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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